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Strategizing Economy Using Spiral Spring Process Model (SSPM)

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Abstract:
The importance of strategic economic planning cannot be overemphasized. A robust, viable and suitable economic well-being of a nation makes for a sustainable and progressive developing nation. Spiral Spring Process Model (SSPM) is a tool that was developed in the course of a research project for Information Resource Management (IRM) tool for the public sector of nations. It has a potential energy for carrying the growing population capacity with an elastic limit beyond which it can break if the system is not reassessed or reevaluated in due time. This tool is used for managing a growing population, economic planning as well as forecasting for future events.

Keywords: *Strategic economic planning, SSPM, forecasting, potential energy and elastic limit*

1. Introduction

Effective and efficient management of economy of any nation cannot be overemphasized. This is because suitable economic power of a nation makes for a sustainable and progressive developing nation, thereby making the populace of that nation happy and peaceful.
For every given economy, there is always a demand and supply issue. It is expected that economic experts will be there to aid a growing population. As days go by, there is always a population growth requiring more supply of goods and services in the nation. In other words, if the population is not properly managed and attended to base on its demand, it could lead to an economic crash.
For instance, in Nigeria, Warri refinery stations was processing about 100,000 bpd for her population consumption as at 1978 [www.nnpc.org.ng] but with fast growing population, Nigerian refineries can no longer service her population with refined petroleum products. Since the planning was inappropriate and inadequate, we now depend on importation of petroleum products to meet the current demand [see table 1]. As at May 25, 2015, banks and telecommunication companies in Nigeria were almost shutting down because of shortage of petroleum products to power their systems. It would have been easier and better for the system if there was a projection, tactical planning, good policy making and implementation as the population was growing.

1.1. Spiral Spring Process Model (SSPM)

Spiral Spring Process Model (SSPM) is developed in the course of developing a people-centred information management resource (IRM) tool for the public sector in Nigeria as well as the developing nations. It has an elastic limit beyond which it can break if exceeded without reassessment. SSPM, figure 1, is a tool of variable concentric circles designed to assume capacity of a growing system over a period or range of time. This tool represents the capacity of a system as time increases. The model is spiral because it is a developing concentric circle which is circles of planning, decision-making and implementation. It is a spring because it has a potential energy of carrying the system growing population or workforce that it was built for over a period of time.

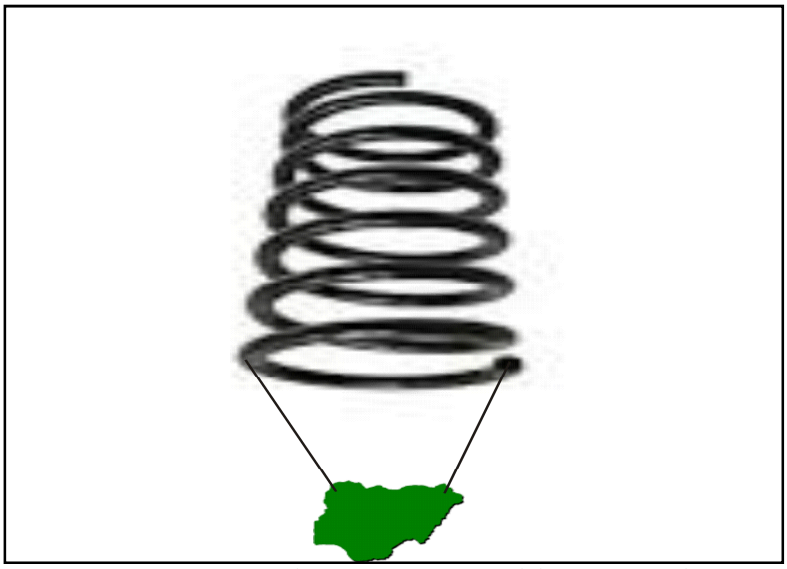

Figure 1: A Spiral Spring Process Model (SSPM) Tool

As a result of growing and aging population, there is always a demand on the government to provide additional services that will directly increase the economic growth and build capacity to raise revenue over a very long term and this is where the SSPM becomes relevant. The main aim of SSPM for any system or project is to build a potential capacity that will maintain or manage a growing workforce so that it cannot crash by any means. A very long term approach is needed to boost economic growth in response to the demands of a growing population. Using SSPM will provide a picture to the government or any other relevant body on expected demand and supply in a given system over a given period of time. This will in turn lead to higher productivity, improve planning and build more economic competition, create more jobs for the teeming population and increase household incomes.

1.2. Conditions Affecting Strategic Planning Using SSPM

The following conditions will affect the use of SSPM in any given system:

- Population forecasting over a long term
- Current state of economy and infrastructure
- Quality of decision / policy makers

The economist and leaders managing the national economy must have abilities to strategically utilize the commonwealth of the system. This will ensure building a better potential for the system over a long term, thereby meeting the demand of the growing population. Nigeria in 1960 for example, was a growing economy with a population of about 46 million. At that time, it demands that quality planning and relevant decision would have been taken by the policy makers, which would have led to designing a system that would handle the growing population for at least over a period of fifty years.

But not minding the current state of backwardness in the delivery of a workable strategic planning, Nigeria can still start from now to meet being among the world best economies by 2050. To meet this target, we must carefully consider the factors affecting strategic planning, build a standard national database, and prepare for recovery by expanding our skill-base, support new industries along with our traditional capacity building and developing new job creation programs. If all these are kept properly in place, it will in turn increase our gross domestic product (GDP) and increase our financial reserve. Nigeria can be one of the World's best if we want.

Table 1 below is a representation of the Nigeria case. The first refinery in Nigeria was commissioned in 1978. It was built to process about 100,000 barrels of crude per day. In 1987, it was impossible to process 125,000 barrels per day. The processed crude per day is currently not meeting up with the Nigerian population demand. The Nigerian refinery is producing only 10.46% of the national demand, which is not enough for local consumption talk less of export. In Nigeria the primary capacity as at 2014 was 342,000 bpd.

"The reason why Nigeria refining capacity falls below expectation is because of a 'defective policy framework'; greed and corruption. These are the key factors that have adversely affected the nation's booming oil and gas sector, especially in oil refining." [Extract from thenationonline.net]

Year	Quantity of crude processed barrel/day	expected Quantity barrel/day	% import	%Export	Expert's comment
1975	0	45,000	100%	0%	At this time Nigeria has no refinery
1976	0	69,000	100%	0%	At this time Nigeria has no refinery
1977	0	76,000	100%	0%	At this time Nigeria has no refinery
1978	100,000	80,000	0%	0%	Maximum
1979	100,000	82,000	0%	0%	Maximum
1980	100,000	81,000	0%	0%	Maximum
1981	100,000	90,000	0%	0%	Maximum
1982	100,000	98,000	0%	0%	Maximum
1983	100,000	130,000	30%	0%	Bellow capacity
1984	100,000	110,000	30%	0%	Bellow capacity
1985	100,000	122,000	30%	0%	Bellow capacity
1986	100,000	150,000	30%	0%	Bellow capacity
1987	125,000	230,000	Over 80%	0%	Bellow capacity
1988	125,000	220,000	Over 80%	0%	Bellow capacity
1989	125,000	250,000	Over 80%	0%	Bellow capacity
1990	125,000	280,000	Over 80%	0%	Bellow capacity
1991	230,000	290,000	Over 80%	0%	Bellow capacity
1992	300,000	350,000	Over 80%	0%	Bellow capacity
1993	300,000	370,000	Over 80%	0%	Bellow capacity
1994	300,000	380,000	Over 80%	0%	Bellow capacity
1995	300,000	400,000	Over 80%	0%	Bellow capacity
1996	300,000	420,000	Over 80%	0%	the system is already crashing
1997	330,000	460,000	Over 80%	0%	the system is already crashing
1998	330,000	500,000	Over 80%	0%	the system is already crashing
1999	330,000	540,000	Over 80%	0%	the system is already crashing
2000	330,000	580,000	Over 80%	0%	the system is already crashing
2001	330,000	620,000	Over 80%	0%	the system crashing
2002	330,000	660,000	Over 80%	0%	the system crashing
2003	330,000	1,300,000	Over 80%	0%	the system crashing
2004	330,000	1,600,000	Over 80%	0%	the system crashing
2005	330,000	1,900,000	Over 80%	0%	the system crashing
2006	330,000	2,200,000	Over 80%	0%	the system crashing
2007	330,000	2,500,000	Over 80%	0%	the system crashing
2008	330,000	2,800,000	Over 80%	0%	the system crashing
2009	330,000	3,100,000	Over 80%	0%	the system crashing
2010	330,000	3,400,000	Over 80%	0%	the system crashing
2011	330,000	3,700,000	Over 80%	0%	the system crashing
2012	340,000	4,000,000	Over 80%	0%	the system crashing
2013	340,000	4,300,000	Over 80%	0%	the system crashing
2014	340,000	4,600,000	Over 80%	0%	the system crashing
2015	355,000	4,900,000	Over 80%	0%	the system crashing

Table 1: Assumed records for the Nigerian refined products from 1975-2015

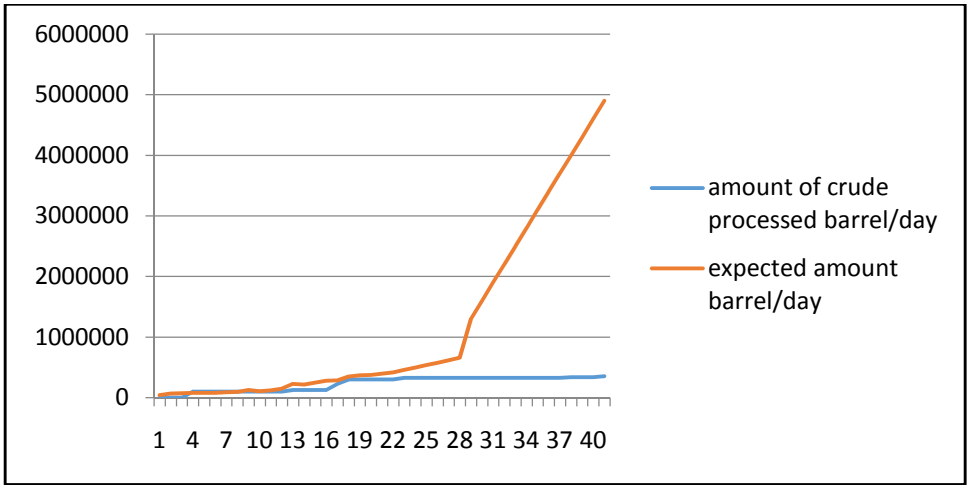

Figure 2

Graph of Actual versus Expected refined Petroleum products in Nigeria between 1975-2015

Looking at the graph of the expected crude to be processed and the actual processed, you will notice that there is very wide gap. The gap is wide, in other words the system has crashed. SSPM can now be introduced to correct the fault in the system by dealing with "the defective policy framework".

With the current oil problem in Nigeria, a solution can be proffered to help the system over a long period of term. As at 2015, the system crash is above 80%. We need over 80% import of refined products to temporally stabilize the system. Obviously, table 1 depicts a critical Nigeria problem as of today.

1.3. Strategically, the Problem Can Be Overcome by the Following Steps

- Analyze the current problem in table 1
- Analyze available funds/income for correction of the present crash over time
- Determine the system capacity, that is, the amount of crude oil to be processed daily to meet the national demand
- Determine the capacity of the current infrastructure – improve on the output as well as building new refineries to meet target
- With our income, estimate the duration the current problem will be overcome by meeting the population requirement.

After solving the current oil problem crisis crash in the system, and the system is now able to sustain itself, the planners can now strategically consider long term increase for exporting finished refined petroleum products.

1.4. Procedures in Using SSPM

- Forecast population and tabulate it
- Note current economic status
- Note current infrastructural capacity
- Using forecasted population, determine best infrastructural capacity
- Using forecasted population, determine best economic state for different years
- Using the determined economic state, determine the best improvement to achieve the best economic states respectively
- Ensure that the workforce on the system does not reach an elastic limit at any time
- Draw the model
- Interpret the model for easy assessment by experts and policy makers

2. A Case Study Illustrating the Use of SSPM to Analyzie and Strategize for Future Event

A consultant was hired to determine the building capacity infrastructures using an SSPM for a country's federal civil service for both old and newly employed staff. This projection is needed to estimate the accommodation requirement for the entire staff population for 15yrs using 2001 as the base year. What amount of infrastructure can take care of the federal staff population in 2015 assuming the population records is gotten from the National population commission as shown below and the budgetary allocation for 40,000 housing capacity is 500 million Naira.

time(year)	Budget Allocation	L(Number of houses built per year)=CAPACITY	F(Number of newly/old employed Federal Civil Servants)	cum.L	cum.F
2001	take off point	5000	40000	5000	40000
2002	500,000,000	1000	1760	6000	41760
2003	581,000,127	1600	5000	7600	46760
2004	733,002,000	3100	4700	10700	51460
2005	1,100,257,900	6000	3000	16700	54460
2006	1,890,300,990	10000	5000	26700	59460
2007	2,000,134,000	12000	1200	38700	60660
2008	2,587,900,122	14900	12000	53600	72660
2009	2,100,122,000	13100	3000	66700	75660
2010	733,111,000	2000	6000	68700	81660
2011	1,560,000,900	6700	5300	75400	86960
2012	748,800,000	2200	2000	77600	88960
2013	788,800,000	3000	7000	80600	95960
2014	500,000,000	1000	3000	81600	98960
2015					

Table 2: Solution

Table showing the provisions of houses to FCServants in the federation.

Cum.L=Cummulative of the number of houses built for FCS represent each revolution in the SSPM.

Cum.F= Cumulative of the population of the employed Federal civil servants.

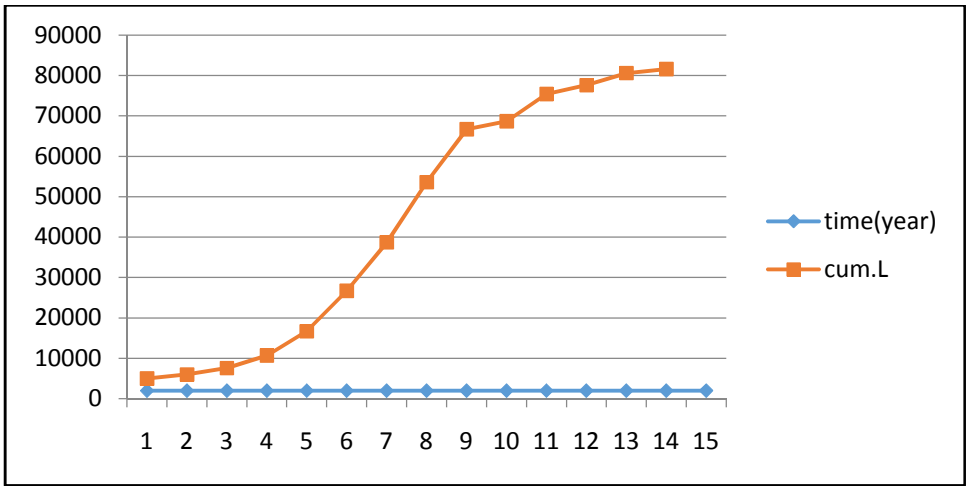

Figure 3

Graph showing the growth of infrastructure with time

As time increases, policies are constantly reevaluated to create a potential (Housing) to accommodate the growing workforce.

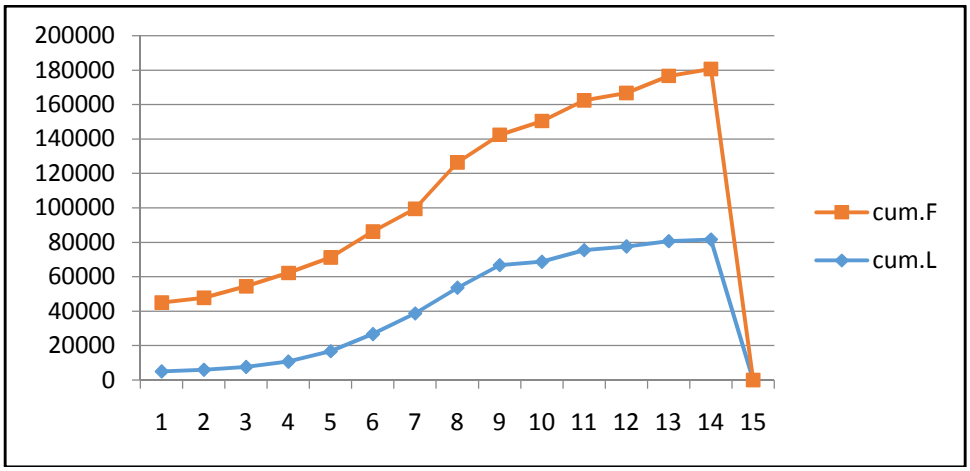

Figure 3

A graph showing the growth of the work force with infrastructure. The work force has grown higher than the infrastructure, so the graph is showing the crash in the system.

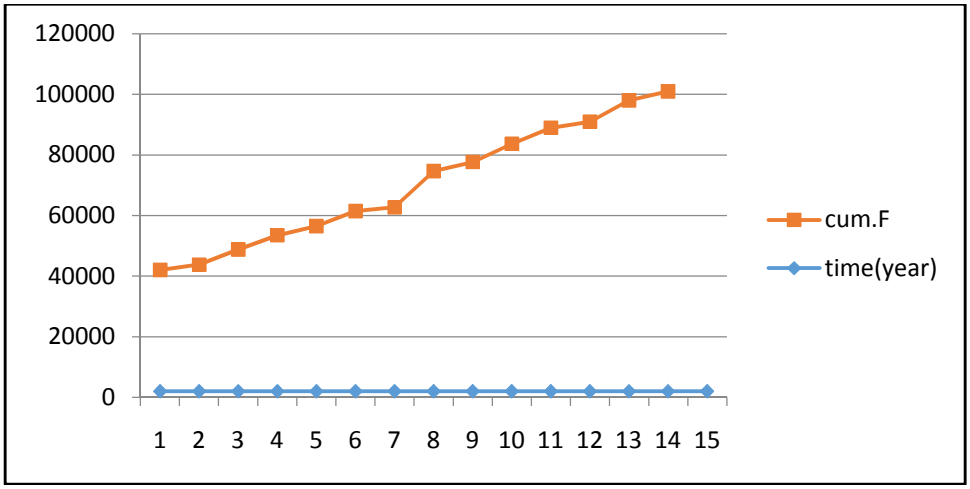

Figure 4

A graph showing the increase of the work force with time.

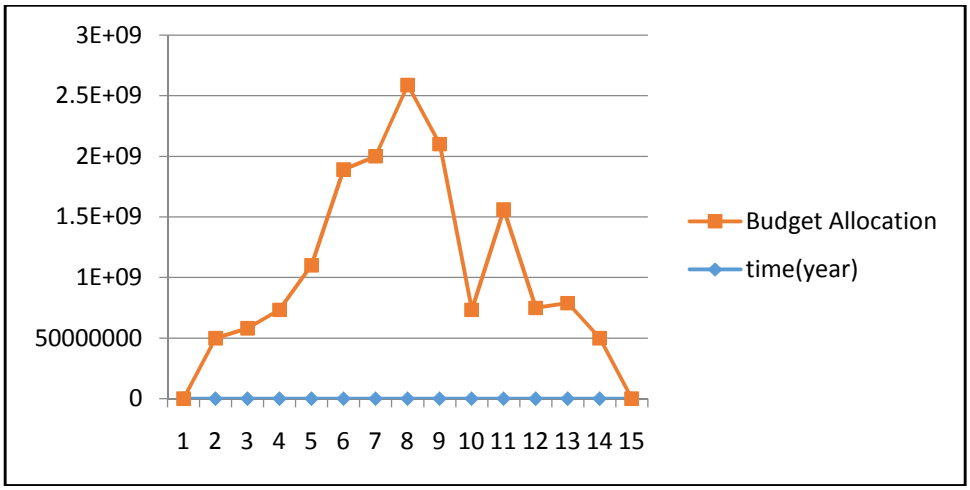

Figure 4

A graph showing budgetary allocation with time.

CASE STUDY 2: (Extract from www.theijst.com, April 2015 Issue)

Let's illustrate SSPM with hypothetical values of activities of MDAs.

A consultant is hired to design an SSPM for a country population that was 37,000,000 in 2010 and the infrastructure capacity for 1000 people was estimated at 3000tons. What amount of infrastructure can take care of the population in 2025 assuming $4000 can take care of the infrastructure of 1000 people if the rate of population growth is 5%. Using the Population Geometrical function: Xt = x0(1+r)^t

Year	**Xi (conc.cycles)**	**Estimated population (Xt)**	**rate**	**Increase rate**		**estimated capacity(L/ton)**	**estimated budget assuming global economy is constant**	**COMMENT**		
2010	x0	37,000,000	0.05			67,000,000		IT IS NOT MEETING 2010 TARGET		
2011	x1	40792500	1.05	1.1025		122377500				
2012	x2	49358925	1.1	1.21		148076775				
2013	x3	65277178.31	1.15	1.3225		195831534.9				
2014	x4	93999136.77	1.2	1.44		281997410.3				
2015	x5	146873651.2	1.25	1.5625		440620953.6				
2016	x6	248216470.5	1.3	1.69		744649411.6				
2017	x7	452374517.5	1.35	1.8225		1357123553				
2018	x8	886654054.4	1.4	1.96		2659962163				
2019	x9	1864190149	1.45	2.1025		5592570448				
2020	x10	4194427836	1.5	2.25		12583283508				
2021	x11	10077112876	1.55	2.4025		30231338628				
2022	x12	25797408963	1.6	2.56		77392226889				
2023	x13	70233445901	1.65	2.7225		2.107E+11				
2024	x14	2.02975E+11	1.7	2.89		6.08924E+11				
2025	x15	6.2161E+11	1.75	3.0625		1.86483E+12				
					∫L dL=	2,816,271,048,840				
	Population Geometrical function: Xt = x0(1+r)^t									

Table 3: Solution

Between 2010 to 2015 (n=15) which means there is a need for 15 revolutions of 15 circles

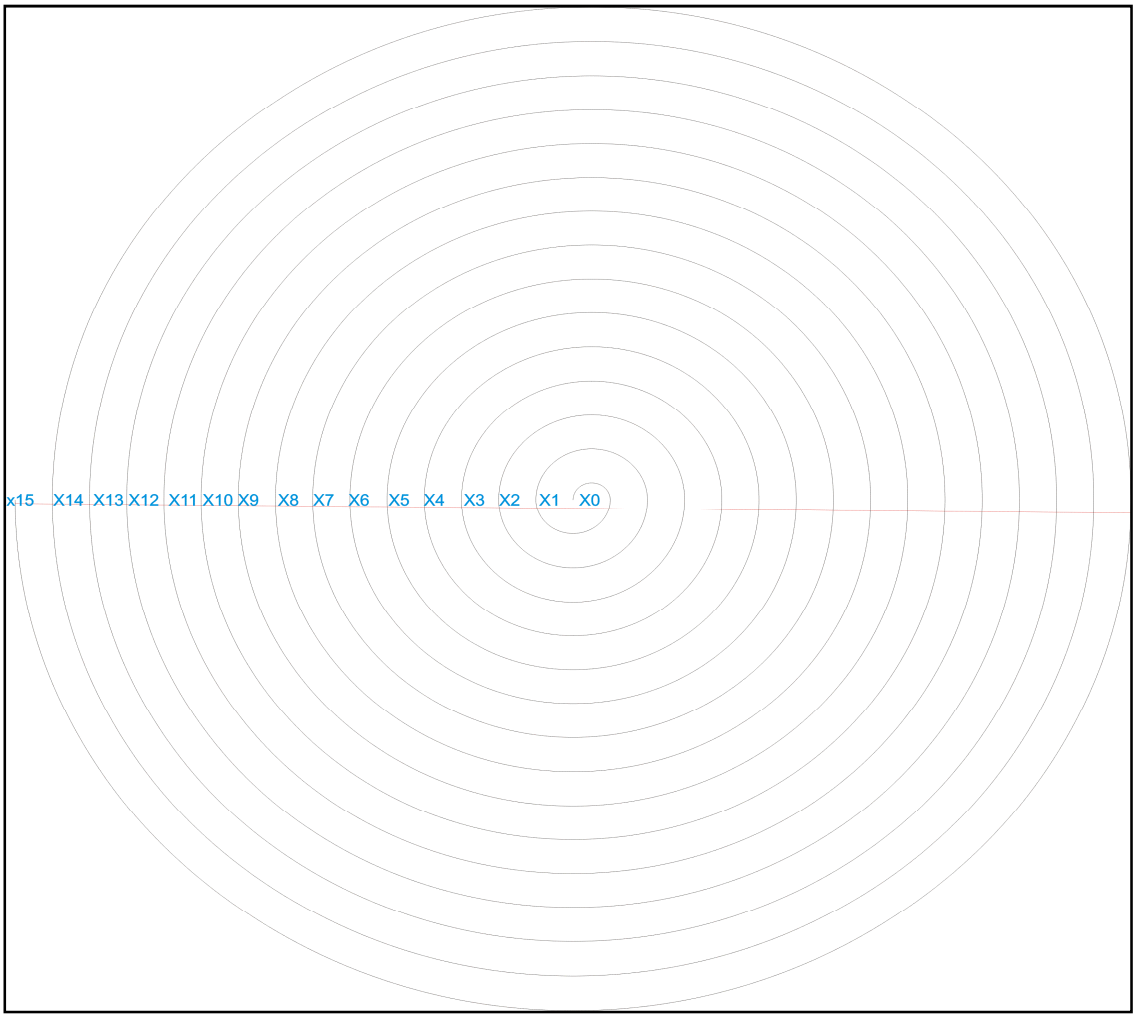

Figure 5

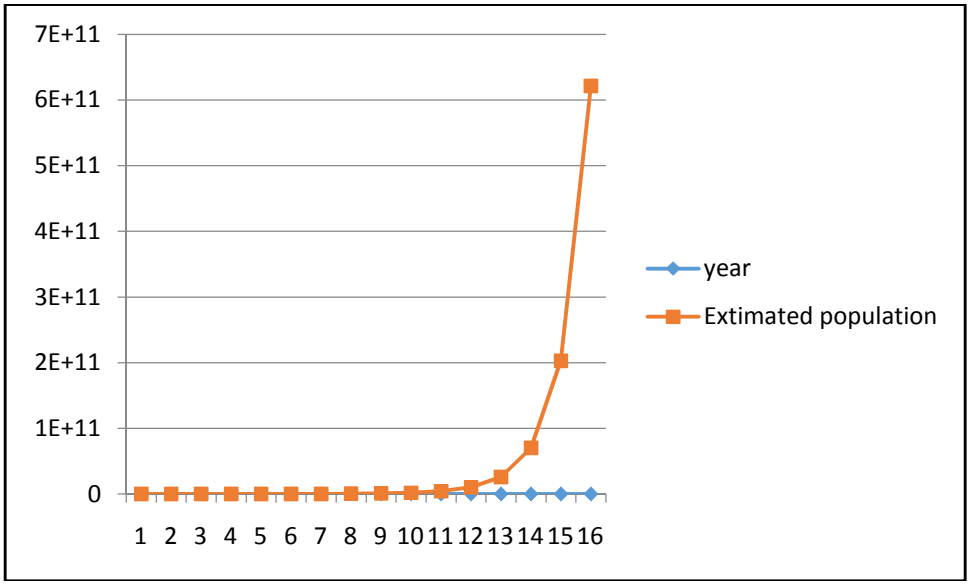

Figure 6

Graph showing population growth within 15 years following a geometric function.

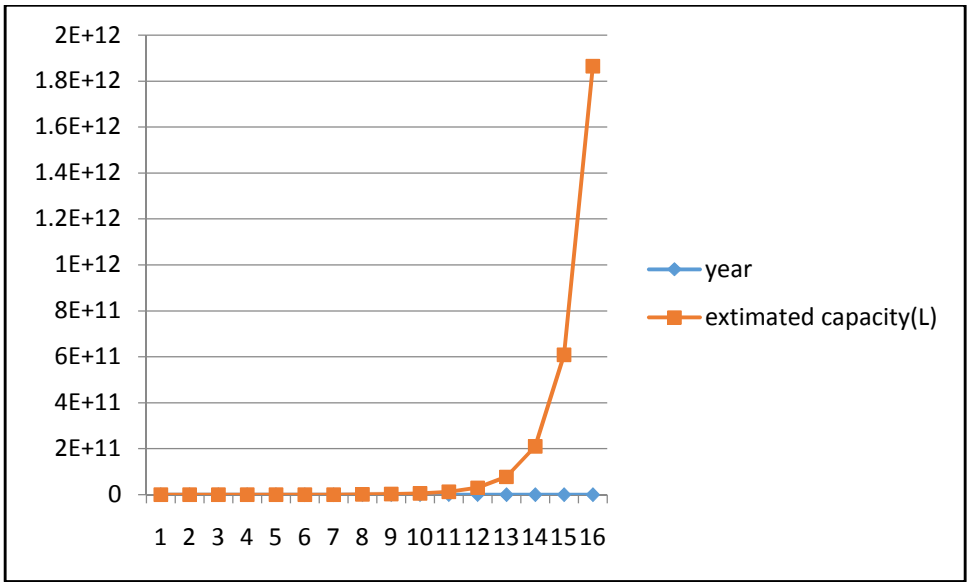

Figure 7

Graph showing estimated Capacity to carry the estimated population.

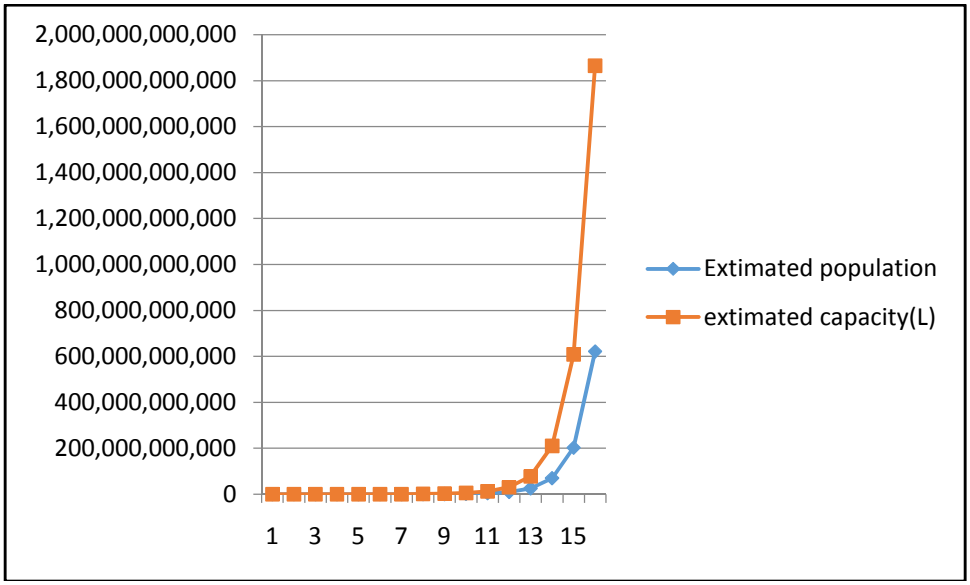

Figure 8

Graph demonstrating the above SSPM showing that the estimated capacity for 2025 can be able to carry the estimated population from 2011 to the next 14 years.
The case 2 study was brought in to illustrate that the SSPM can be used to forecast for future economic strategic planning in a nation's economy. It is expected that law/policy makers revisit the model to actualize their annual targets.

3. Challenges Using SSPM for Economic Strategy

- ❖ Law makers, Policy and Decision makers must be versatile with the system
- ❖ Level of illiteracy in the system
- ❖ Growth and location of the said population
- ❖ Natural potential of the location of the said population
- ❖ Re-evaluation and Re-assessment of capacity
- ❖ Human capital

3.1. SSPM as a tool for Long Term Strategic Planning Have a Number of Key Elements

- Enhances planning and decision making
- Boosting productive capacity
- Creating industries for the future (i.e. futuristic forecasting or planning so that the system, don't crash at all)

- Managing population growth
- Strengthening fiscal capacity

4. Conclusion

Using SSPM to manage and strategize economic well-being and long term economic planning of a nation will lead to sustainability, progress, accountability, growth and satisfaction among the populace. It will show that the government is alive to their responsibilities towards their citizens and will lead to peace and harmony in the society.

5. References

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ii. www.thenationonline.net
iii. www.theijst.com,ISSN 2321-919X, April 2015 Issue) SPIRAL SPRING PROCESS MODEL (SSPM) FOR POLICY MAKING AND IMPLEMENTATION ENGINEERING IN MINISTRIES, DEPARTMENTS AND AGENCIES (MDAs)